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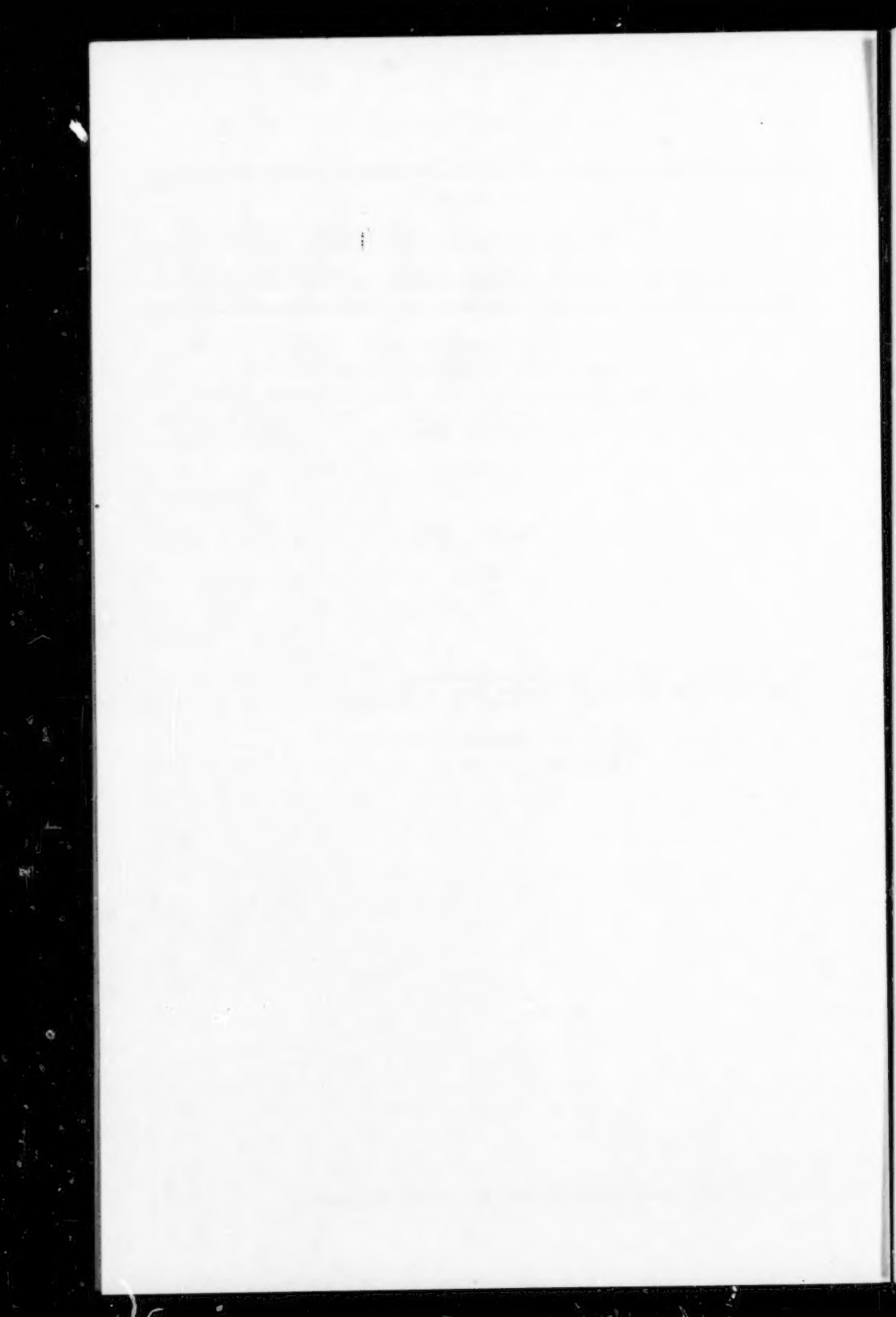
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Journal of the
CITY PLANNING DIVISION
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POPULATION ESTIMATES FOR THE STATE OF OKLAHOMA

George W. Reid,¹ A. M., ASCE, G. B. Treat,² A. M. ASCE, and F. J. Wilson³
(Proc. Paper 1136)

ABSTRACT

Population estimates for Oklahoma in years 2000 and 2050 have been made on the premise that the population of the United States will continue to grow following theoretical population growth patterns and that the already saturated portions of the nation unable to accommodate those increases will cause migration to less populous areas capable of denser urbanized development. In any natural system one basic element in short supply usually controls growth, in Oklahoma all elements appear to be present with the exception of water. Oklahoma's growth, through migration and resulting catalytic growth appears to hinge on water resources; consequently, these estimates should be used only as a guide to the future development provided Oklahoma's water resources can be developed to the fullest.

The art, not science, of demography is very old, particularly that portion which deals with population estimates. Engineers for years have been faced with the necessity of predicting future population in order to establish design criteria. Unfortunately, unlike other engineering data, population growth rates are biological in nature, influenced by such factors as birthrate, death-rate, migration, marriage rate, social and economical conditions, as well as war and other nature catastrophes, and certainly do not lend themselves to exact analysis. Consequently, one is dealing with estimates, not truth, but generally near enough to be of practical use.

There are many approaches to the problem of predicting future population. Those predicted on reference to past records include arithmetic, geometric, incremental increase, curvilinear, and logistic projections. The simple

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1. Associate Prof. of Civ. Eng., Univ. of Oklahoma, Norman, Okla.
2. Cons. Engr., Oklahoma City, Okla.
3. Cons. Engr., Oklahoma City, Okla.

arithmetic or geometric projections have serious limitations in forecasting—the former generally being too low and the latter too high. The incremental increase method is a refinement of the simpler trends permitting prediction to be influenced by the rate of change as well as trend. There are other methods, including, for example, population theory in which a detailed demographic study is made and used as a guide in extending the population forward. Also, it is common to use the techniques mentioned before on large group prediction and then prorate it to smaller component parts.

The curvilinear method is simply a comparison of a similar but longer group of data to the one being studied after they have reached the size of the group under consideration.

The logistic technique, developed by Pearl,* is a matter of fitting a past experience into a biological growth curve and projecting forward. This curve commences slowly, then develops rapidly and finally dies off as the growth deteriorates in its own by-products. All of these methods predict future growths based on the past experience of the particular population group under study.

Population growth depends not only on biologic and economic factors but also on the availability of natural resources. The effect of alterations in the availability of natural resources on future populations certainly would not be adequately handled by basing prediction on past experience. In any natural system all elements necessary for growth never appear to be available in the proper balanced amounts and invariably one element will be in short supply and thus become the controlling factor of growth. It is the author's considered opinion that in Oklahoma water is the controlling factor and perhaps the attendant waste water disposal.

One approach recognizing water, but assuming that water could be obtained in ample supply, and based on possible industrial and commercial development has been used by Cella.** In this method marketing areas are synthetically developed industrially; the required direct and supporting population predicted; and finally the water needs computed. The method does not take water as the controlling factor but suggests industrial development as a controlling factor.

Obviously, the larger the group of data the more reliable the data and more dependence that can be placed on past experience techniques. The author would approach Oklahoma's population prediction by first using one or two of the more reasonable methods on the nation as a whole and then assuming saturation of certain areas would cause a weighted proportioning of this increase throughout the various states.

Thus in this study the incremental and logistic techniques have been used on the national growth, assuming no migration in or out of the United States. This growth is then distributed to Oklahoma by three weighting factors intended to reflect attractiveness due to increased water resources. These factors are based on the ratio of urban growth rate; urbanization, and population density of well water areas of the nation to the present values in Oklahoma.

Following the same general theme with a slightly different approach, the author has synthesized by the curvilinear method the growth of Oklahoma by comparison to the growths of highly developed well watered areas.

* Dr. Raymond Pearl, *Science* N.S.LI, p. 553.

** Mr. Francis Cella, *Oklahoma Population Studies*, Bureau of Business Resources, University of Oklahoma, 1955.

National Population

Many predictions of the future population of the nation have been made. The director of the bureau of census in 1945 put a ceiling on our national population of 163 million, estimated to occur in 1980. This prediction, among other things, was based on declining birth rates, competition for food, and absence of immigration. Whipple* in 1920, predicted, based on the difference between birth and death rates, populations of 150, 250, and 400 millions in 1950, 2000, and 2050, respectively. At that time the difference was 10/1000. From table I, it can readily be seen that the present difference is 15.1/1000 while in 1945, at the time of the ceiling prediction, it was 8.9.

Another prediction by Davis in 1955, based on growth rate, indicated a population of 275 millions by the year 2000.

The author has used two methods, the incremental and the logistic, arriving at the populations of 235 millions and 203 millions respectively, in the year 2000, and tabulated in Table V.

Oklahoma's Population Estimate

During the past two decades, Oklahoma has been making a transition from a rural agricultural state to an urban industrial state and the trend seems likely to continue, especially if adequate water is provided.

Three methods used in weighing Oklahoma's portion of the national increase are based on urbanization, they are:

- (1) A comparison of the rate of Oklahoma's urban development (13%) to the national (8%). Since 51% of the state population is urban, this weighting is reduced accordingly.

$$13/8 \times .51 = 1.30$$

- (2) A weighing factor based on the ratio of the density of population in well watered areas (75.9) to the density of population in Oklahoma (32). (Table II).

$$75.9/32 = 2.40$$

- (3) A weighing factor based on the ratio of percentage urbanization in well watered states (74.9) to percentage urbanization in Oklahoma. (See Table 3)

$$74.9/51 = 1.47$$

Finally utilizing the well watered states (shown in Table 4) a curvelinear plot is developed in Figure 1 to predict Oklahoma's population. Two assumptions are made—one, that only 2/3 of the state develops, (say that east of the 30" isobar and the other third stays basically rural), the other, that the entire state is affected.

CONCLUSIONS

Population futures developed by the various techniques are shown for comparison purposes in Table V and VI and Figure 2.** Actually ten distinct

* George Whipple, Vital Statistics, John Wiley & Sons, 1923.

** Two sets of weighted values are determined, based on each of the two methods of estimating the national increases. The notation "a" is used for values determined by logistic method.

values have been plotted; this is not to confuse but point out the extreme undesirability of centering on any specific values for such distant times as year 2000 and 2050. These values should simply serve as trends. Using a sound engineering technique of averaging; populations of 4,220,000; 4,750,000; and 5,625,000 in years 2000, 2020, and 2050, respectively could be used as general trend locations—let's call them discussion possibilities. The various methods range for year 2000 from 3,019,000 to 5,300,000 with coefficient of variation of approximately 25%.

These trends of growth are based on the premise that the national population will, without migration, follow a theoretical population growth pattern and that saturated urbanized area will refuse growth causing migration into area capable of expansion. Oklahoma's capability of expansion, the author believes, depends mostly on her ability to develop large and dependable water resources. As a matter of interest, the author believes that the lowest of these estimates 3,019,000 in 2000, using the state rise as directly proportional to the national, will not occur without increased water resources.

In discussing the methods used, the national growth prediction apparently might be considered conservative. Whipple in 1920, using an excess of birth over deaths of 10/1000 arrived at 400,000,000 in 2050. Though there was a slump a few years ago, the present rate is 15/1000. The problem was to redistribute the national population. The author has elected four methods—three based on weighing factors of ratio of % urbanization, density, and urbanization growth, and the fourth a synthesis based on density. In all cases these facts were selected to indicate growth resulting from industrial development in well watered areas. The criteria of density saturation is believed to be a good one. The author's calculations are based on approaching a figure of 75. Actually 16 states have already exceeded this figure, and one as high as 749. As evidence of being conservative, these values were applied only to the present rate of urbanized area. It should also be pointed out that these figures could be refined, particularly with reference to water development in other less populated states. This was not considered warranted and certainly would increase these estimates.

Migration and catalytic growth resulting most certainly will follow if larger water volumes are maintained in Oklahoma, particularly when at present 1-1/2 million gallons of water per person per year are required to support community living and industry.

The author cannot resist pointing out Oklahoma's opportunity to direct this growth, such that it develops into an economically balanced society.

TABLE I
COMPARISON OF NATIONAL BIRTH AND DEATH RATES
In Persons Per 1000

| <u>Year</u> | <u>Birth Rate</u> | <u>Death Rate</u> | <u>Difference</u> |
|-------------|-------------------|-------------------|-------------------|
| 1935 | 16.9 | 10.9 | 6.0 |
| 1939 | 17.3 | 10.6 | 6.7 |
| 1940 | 17.9 | 10.8 | 7.1 |
| 1941 | 18.8 | 10.5 | 8.3 |
| 1942 | 20.8 | 10.3 | 10.5 |
| 1943 | 21.5 | 10.9 | 10.6 |
| 1944 | 20.2 | 10.6 | 9.6 |
| 1945 | 19.5 | 10.6 | 8.9 |
| 1946 | 23.3 | 10.0 | 13.3 |
| 1947 | 25.8 | 10.1 | 15.7 |
| 1948 | 24.2 | 9.9 | 14.3 |
| 1949 | 23.9 | 9.7 | 14.2 |
| 1950 | 23.6 | 9.6 | 14.0 |
| 1951 | 24.5 | 9.7 | 14.8 |
| 1952 | 24.6 | 9.6 | 15.0 |
| 1953 | 24.7 | 9.6 | 15.1 |

TABLE II

POPULATION DENSITY PER SQUARE MILE

| <u>State</u> | <u>Density</u> | <u>Relative Density</u> |
|----------------|----------------|-----------------------------|
| Nevada | 2 | .06 |
| Wyoming | 3 | .09 |
| Montana | 4 | .13 |
| New Mexico | 6 | .19 |
| Idaho | 7 | .22 |
| Arizona | 7 | .22 |
| Utah | 8 | .25 |
| South Dakota | 9 | .28 |
| North Dakota | 9 | .28 |
| Colorado | 13 | .40 |
| Oregon | 16 | .50 |
| Nebraska | 17 | .53 |
| Kansas | 23 | .72 |
| Maine | 29 | .90 |
| Texas | 29 | .90 |
| Oklahoma | 32 | 1.00 |
| Washington | 36 | 1.12 |
| Arkansas | 36 | 1.12 |
| Minnesota | 37 | 1.16 |
| Vermont | 41 | 1.28 |
| Mississippi | 46 | 1.44 |
| Iowa | 47 | 1.47 |
| Florida | 51 | 1.60 |
| Missouri | 57 | 1.81 |
| Georgia | 59 | 1.85 |
| Louisiana | 59 | 1.85 |
| New Hampshire | 59 | 1.85 |
| Alabama | 60 | 1.88 |
| Wisconsin | 63 | 1.97 |
| California | 68 | 2.12 |
| South Carolina | 70 | 2.18 |
| Kentucky | 74 | 2.31 |
| Tennessee | 79 | 2.47 |
| West Virginia | 83 | 2.60 |
| Virginia | 83 | 2.60 |
| North Carolina | 83 | 2.60 |
| Indiana | 109 | 3.40 |
| Michigan | 112 | 3.50 |
| Illinois | 156 | 4.86 |
| Delaware | 161 | 5.04 |
| Ohio | 194 | 7.28 |
| Pennsylvania | 233 | 7.28 |
| Maryland | 239 | 7.47 |
| New York | 309 | 9.65 |
| Connecticut | 410 | 12.8 |
| Massachusetts | 596 | 18.6 |
| New Jersey | 643 | 20.1 |
| Rhode Island | 749 | 23.4 |

TABLE III

PER CENT URBAN POPULATION

| <u>State</u> | <u>% Urban</u> | <u>Relative Urbanization</u> |
|----------------|----------------|----------------------------------|
| North Dakota | 26.6 | .52 |
| Mississippi | 27.9 | .55 |
| Arkansas | 33.0 | .65 |
| South Dakota | 33.3 | .65 |
| North Carolina | 33.7 | .66 |
| West Virginia | 34.8 | .68 |
| Vermont | 36.5 | .72 |
| Kentucky | 36.8 | .72 |
| South Carolina | 36.8 | .72 |
| Idaho | 43.0 | .84 |
| Montana | 43.7 | .86 |
| Alabama | 43.8 | .86 |
| Tennessee | 44.1 | .87 |
| Florida | 45.5 | .89 |
| Nebraska | 46.9 | .92 |
| Virginia | 47.0 | .92 |
| New Mexico | 47.6 | .93 |
| Iowa | 47.7 | .94 |
| New Hampshire | 48.5 | .95 |
| Wyoming | 49.7 | .97 |
| Oklahoma | 51.0 | 1.00 |
| Maine | 51.7 | 1.02 |
| Kansas | 52.1 | 1.02 |
| Oregon | 53.8 | 1.05 |
| Minnesota | 54.5 | 1.07 |
| Louisiana | 59.8 | 1.17 |
| Arizona | 55.5 | 1.09 |
| Nevada | 57.5 | 1.13 |
| Wisconsin | 57.9 | 1.14 |
| Indiana | 59.9 | 1.17 |
| Missouri | 61.5 | 1.21 |
| Delaware | 62.6 | 1.23 |
| Texas | 62.7 | 1.23 |
| Colorado | 62.7 | 1.23 |
| Washington | 63.2 | 1.24 |
| Utah | 65.3 | 1.28 |
| Florida | 65.5 | 1.29 |
| Maryland | 69.0 | 1.35 |
| Ohio | 70.2 | 1.38 |
| Michigan | 70.7 | 1.39 |
| Pennsylvania | 71.5 | 1.40 |
| Illinois | 77.6 | 1.52 |
| Connecticut | 77.7 | 1.52 |
| California | 80.7 | 1.58 |
| Rhode Island | 84.2 | 1.65 |
| Massachusetts | 84.4 | 1.65 |
| New York | 85.5 | 1.68 |
| New Jersey | 86.2 | 1.69 |

TABLE IV
POPULATION DENSITY OF SELECTED STATES CONSIDERED SIMILAR IN AREA
& CLIMATICAL CONDITIONS TO OKLAHOMA, AND IN MOST CASES
PLENTIFUL WATER & SOME NAVIGATION

| | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 |
|----------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| Ohio | 22.9 | 37.0 | 48.3 | 57.0 | 55.4 | 78.5 | 90.1 | 102.1 | 117.0 | 141.4 | 161.6 | 168.0 | 193.8 |
| Indiana | | | 27.3 | 37.3 | 46.8 | 55.1 | 61.1 | 70.1 | 74.9 | 81.3 | 89.4 | 94.7 | 108.7 |
| Illinois | | | | 30.7 | 45.4 | 55.0 | 68.3 | 86.1 | 100.6 | 115.7 | 136.4 | 141.2 | 155.8 |
| Michigan | | | | | 20.6 | 28.5 | 36.4 | 42.1 | 48.9 | 63.8 | 89.9 | 92.2 | 111.7 |
| Wisconsin | | | | | 19.1 | 23.8 | 30.6 | 37.4 | 42.2 | 47.6 | 53.7 | 57.3 | 62.8 |
| Missouri | | | | | 25.0 | 31.6 | 39.0 | 45.2 | 47.9 | 49.5 | 52.4 | 54.6 | 57.1 |
| Virginia | | | | | 30.4 | 37.6 | 41.1 | 46.1 | 51.2 | 57.4 | 60.7 | 67.1 | 83.2 |
| West Virginia | | | | | 18.4 | 25.7 | 31.8 | 39.9 | 50.8 | 60.9 | 71.8 | 79.0 | 83.3 |
| North Carolina | | | | | 22.0 | 28.7 | 33.2 | 38.9 | 45.3 | 52.5 | 69.5 | 72.7 | 82.7 |
| Kentucky | | | | | 32.9 | 41.0 | 46.3 | 53.4 | 57.0 | 60.1 | 65.2 | 70.9 | 73.9 |
| Tennessee | | | | | 30.2 | 37.0 | 42.4 | 48.5 | 52.4 | 56.1 | 62.4 | 69.5 | 78.8 |

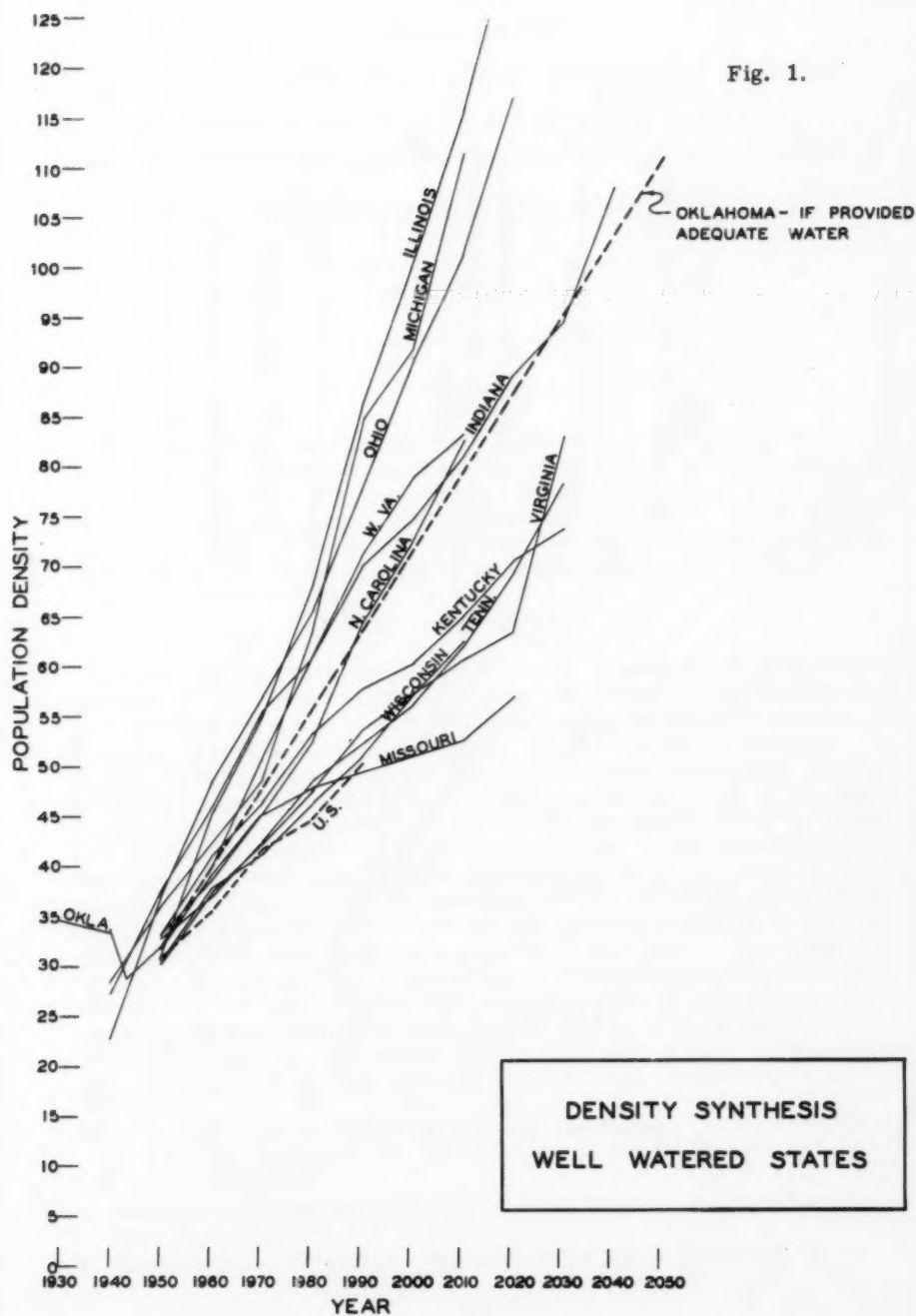
TABLE V
NATIONAL POPULATION

| Method | 1950 | 1975 | Population in Thousands 2000 | 2025 | 2050 |
|---|---------|---------|---------------------------------|---------|----------------|
| Kingsley Davis (National Estimate) | 150,697 | 193,400 | 320,000 | | |
| Bureau of Census (National Estimate-1946) | 150,697 | 162,000 | 163,312 | | |
| Bureau of Census (National Estimate-1955) | 150,697 | 221,000 | | | |
| Swiss Prediction (National Estimate) | 150,697 | | 300,000 | | |
| Pearl Sigmoid Curve, 1920 | 140,000 | | 180,000 | | 200,000 |
| Whipple Excess Births over Deaths | 150,000 | | 250,000 | | 400,000 |
| Walter L. Picton | | 206,600 | | | |
| <u>Incremental (This report)</u> | 150,697 | 191,594 | <u>235,817</u> | 276,053 | <u>343,082</u> |
| <u>Logistic (This report)</u> | 150,697 | 173,000 | <u>203,000</u> | 213,500 | <u>222,000</u> |

TABLE VI
OKLAHOMA POPULATION

| Method | Population in Thousands | | | |
|---|-------------------------|------|-------|-------|
| | 1950 | 1975 | 2000 | 2050 |
| State Population if State Rise is Proportional to National Rise based on Incremental Method | 2,233 | | 3,500 | 4,750 |
| Comparison of Urban Development | 2,233 | | 4,011 | 5,498 |
| Weighted by Density | 2,233 | | 5,300 | 8,180 |
| Weighted by % Urbanization | 2,233 | | 4,090 | 5,920 |
| State Population if State Rise is Proportional to National Rise based on Logistic Method | 2,233 | | 3,019 | 3,290 |
| Comparison of Urban Development | 2,233 | | 3,253 | 3,608 |
| Weighted by Density | 2,233 | | 4,073 | 4,733 |
| Weighted by % Urbanization | 2,233 | | 3,388 | 3,780 |
| Density Synthesis #1 | 2,233 | | 3,765 | 5,585 |
| Density Synthesis #2 | 2,233 | | 4,960 | 7,690 |

Fig. 1.



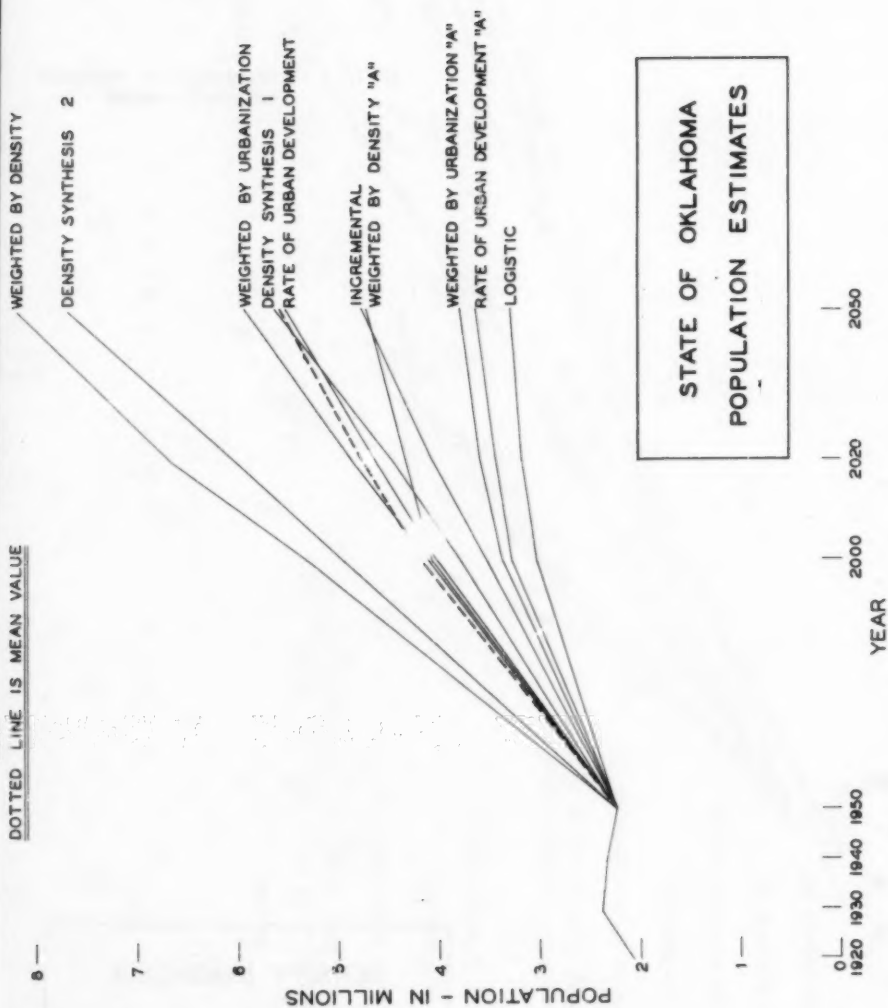


Fig. 2.

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THE CITY PLANNER IN PITTSBURGH'S RENEWAL PROJECTS^a

Patrick J. Cusick, Jr.,¹ M. ASCE
(Proc. Paper 1137)

SUMMARY

Drawing from actual experiences in the Pittsburgh Area this paper describes the contributions that the professional planner has been called upon to make in connection with the rebuilding of the blighted areas of our cities under redevelopment powers. Extensive as these have been to date, substantially expanded activities in this field loom ahead as a consequence of the introduction of the renewal concept in the Federal Housing Act of 1954.

Toward the end of 1949 I met a man who had been one of my professors in graduate school. He was then, and is today, one of those comparatively—rare men who have the ability to achieve success both as an educator and as a practicing professional. His most recent activity outside “ivy-covered halls”—the culmination of years of effort during which his personal contributions were impressive—was the Federal Housing Act of 1949 with its national recognition of redevelopment and the provision of substantial Federal funds to assure the implementation of this relatively-new public activity. Although the concept had been a generally-accepted necessity in the planning profession for years and a few far-sighted states including Pennsylvania had passed redevelopment legislation, activity of this type was then largely in the discussion stage—Pittsburgh being one of the notable exceptions in this regard.

During the course of our conversation my professor remarked that this new law was “probably sending chills down the spines of some planners because for the first time in the history of the field the chances had become better than even that concerted efforts would be made to carry out substantial parts—if not all—of any plan prepared by them.” His contention was that

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- a. Presented at a meeting of the City Planning Division, ASCE, October 18, 1956, Pittsburgh, Pa.
1. Asst. Director, Pittsburgh Regional Planning Assn., Pittsburgh, Pa.

while redevelopment, both by itself as well as by virtue of the effects it would engender, had liberated planners from many of their frustrations, it had imposed new chains of responsibility for the quality of their work that would "make us or break us as a profession."

This opinion has proved to be substantially accurate when considered today—almost seven years later. Due to a large extent to the recognition in the Federal law of the need for a truly-comprehensive approach to the reconstruction of the blighted sections of our cities, the demand for the services of city planners is at an all-time high. The opportunities afforded within and as a result of the redevelopment process have apparently "made" not "broken" us, for if there were chills down any planners' spines, they were few and remarkably well concealed.

No section of this nation has, I believe, more eagerly embraced the redevelopment process than has the Pittsburgh Area. This tool for the achievement of a more livable urban environment has been invoked inside the City itself on eight occasions—ranging from the 23-acre Gateway Center office building complex, through the 20-acre Jones and Laughlin steel mill expansion, to the 96-acre Lower Hill auditorium-cultural-residence project—to name only a few examples. In the area of Allegheny County outside Pittsburgh no projects have been carried out or are yet in the execution stage. But projects involving predominantly industrial reuses in McKeesport and Braddock, business reuses in McKees Rocks and Duquesne, and residential reuses in Rankin are imminent. In addition, studies of other proposed projects are presently being considered; and in this locality, as Emerson so wisely stated, "Thought is the seed of action."

As a consequence of all this activity, some of the results of which you have no doubt seen during the past several days, it is my opinion that when we consider the place of the city planner in urban renewal in the Pittsburgh Area, we are discussing a practical application of the subject which should largely be germane to other parts of the country.

For those of you who are not involved in the technical side of city planning let me explain here that it is generally regarded as being a two-part process. The first part, usually encompassing a period of a year or so, involves the preparation of the master or comprehensive plan for the community. The second part, usually a period of many years, involves the carrying out of the plan either in its original form or, as is usually the case, in a somewhat amended version thereof. Thus, in the planner's effort to create a more desirable city, renewal activities are regarded not as sufficient by and of themselves to accomplish this end but merely as one of a number of indispensable tools to be employed when and as necessary to achieve the goals of the comprehensive plan. The fact that renewal can be breath-takingly dramatic in its accomplishments when compared with other effectuating devices (as, for instance, zoning) does not change the situation.

From the outset Federal legislation has recognized the necessity of a comprehensive plan, or at least the major elements of such a plan, as a basic prerequisite to renewal. However, in recognition of the scarcity of such plans, the Federal agency administering the 1949 Act and its subsequent amendments (now known as the Urban Renewal Administration) has generally been satisfied with evidence of satisfactory progress toward the completion of a master plan. Thus, a municipality desiring to receive a Federal grant for rebuilding itself in part must either present a completed master plan or show evidence of the fact that one is in the process of preparation and will probably be substantially complete prior to the project execution stage.

In 1949 the City of Pittsburgh was the only municipality of the 129 in Allegheny County that had a completed master plan. This had been developed by the staff of Pittsburgh Planning Department about 1945. Moreover, with only one or two exceptions the other 128 communities had given no thought to such an activity—although their need for the guidance that a comprehensive plan could provide was in most cases equal to, if not greater, than Pittsburgh's.

As Pittsburgh's successes in renewal have been extended and as word has spread of the willingness of the U. S. Government to bear two-thirds of the cost of a project (not to mention the substantial grants also available from the Commonwealth of Pennsylvania), interest in comprehensive planning has grown rapidly. As of now 19 of the 129 municipalities in Allegheny County have master plans either completed or substantially so, and at least another 13 or more so well advanced in their consideration of this that it seems safe to predict that most of these will have such plans in the near future.

This process appears certain to accelerate as a consequence of the fact that the Federal funds for planning assistance to communities under 25,000 population, which were included in the Housing Act of 1954, are now available in Pennsylvania. Nevertheless, there still remains an extremely high degree of correlation between interest in master planning on the part of municipalities and their desire to rebuild blighted areas within their boundaries.

Now, I am certain that you recognize that the qualitative aspects of this matter are at least as important as the quantitative. Mere numbers of master plans are at best a shaky index of lasting community progress. More vital is: (a) whether these plans were thoughtfully prepared; (b) whether any continuing technically-competent mechanism has been established for keeping them current and for advising the communities on carrying them out; and (c) whether there is any substantial amount of lay-citizen desire to translate other parts of the plans, than those pertaining to renewal, into steel and concrete.

The best evaluation that can be made at this stage in this locality is that the situation is surprisingly good considering the giant strides ahead that have been taken in so short a period. The word "planning" is practically a household one—although, in all honesty, it often means different things to different people. We can credit the amazingly-successful activities of the Allegheny Conference on Community Development over the past 12 years for this solid base of widespread citizen support of what in some less enlightened sections of the country is often still regarded as a nasty word. So, there is in most communities that embark on the preparation of a master plan a real desire to go beyond the elimination of their slum sections.

In these activities they must have the technical advice of planners, among other professionals. Unfortunately, although there is a growing acceptance of this need, most municipalities to date have been prone to regard their master plans, as prepared, as being sufficient by and of themselves to answer all their requirements along this line. Even if all the qualified professionals in planning were endowed with the omniscience implicit in this assumption, a goodly number of the "sharks" who are being attracted to the field are not, by any means. These people are attracted to the field as a consequence of: (a) the dearth of really competent planners; (b) the availability—for the first time—of reasonably adequate salaries and fees; and (c) the respectability that has recently been accorded the work of the planner. This is resulting in some pretty awful examples of master planning. We can be thankful that these are comparatively few.

Incompetently-prepared plans probably will become almost non-existent in the future as the planning profession expands. Also, the general level of all comprehensive planning in Allegheny County seems certain to benefit substantially in the years ahead as a result of the recent reorganization and restaffing of the County Planning Commission. This agency has the responsibility for preparing the broad framework for planning in the County—for developing the "big picture" within which detailed municipal planning can take place. The lack of such information in recent years has been a major shortcoming of our local planning.

Further, the renewal process itself contains reasonably-effective, inbuilt safeguards against the adverse effects of poor initial comprehensive planning and the tendency of communities to regard the completion of the master plan as the end of their need for further planning services. This is accomplished in several ways both during the project preparation and the project execution phases.

To prepare the necessary redevelopment plans and supporting-documentation, required to obtain the approval of the local, State and Federal groups of a redevelopment project, it has been the practice to date of the three active local authorities (Urban Redevelopment Authority of Pittsburgh, Redevelopment Authority of the City of McKeesport, and Redevelopment Authority of Allegheny County)—with only one exception—to obtain the services of planners. The Pittsburgh agency has, to date at least, made use of the staff of the City Planning Department; the McKeesport Authority has employed the private, non-profit Pittsburgh Regional Planning Association; and the County Redevelopment group has retained the Pittsburgh Regional as well as two private consulting firms.

In order to obtain the maximum Federal grant of two-thirds the net cost of a project, it is necessary to satisfy the extensive, detailed, often difficult-to-comprehend requirements of the Urban Renewal Administration (URA). Because the URA is learning, also, and because the basic legislation has been amended several times since passage, these requirements are frequently changed. However, although they may become simpler and more standardized as time passes, the stakes are so high that it seems no more than reasonable to expect to submit a thorough study of a proposed project before a grant is obtained. Not only that but the URA is usually prepared to bear the expense of such studies as part of the total project cost.

The preparation of the plans and the supporting documentation covering the physical aspects of a redevelopment project calls for the planner to work in substantially closer detail than he usually does. Whether the purists in the profession would say that this is a proper activity for planners, since it most certainly constitutes the effectuation of the comprehensive plan, or whether they would regard it as being more properly the field of the architect and/or the engineer, is a question I refer to others to decide. For what it is worth, however, I believe that, provided it does not become the planner's sole activity, it is very worthwhile. The customary pursuit of the city planner—the comprehensive, long-range study, analysis and recommendations pertaining to the physical needs of a community—usually involves little work with the minutia of land uses, costs, utilities, etc. Renewal planning is a practical exercise in these matters and, as such, cannot help but be beneficial experience.

The happiest situation, from many aspects, would be for the planner who prepared the master plan for a municipality also to follow through on its

renewal projects. This does not necessarily mean that this planner must actually prepare all such studies but that at least his comprehensive knowledge of the local scene should be available to guide the thinking of those involved in such work. Thus, the highest return to the locality from its prior master planning phase would be assured. In the Pittsburgh Area, however, this has not been possible to date, except in the case of Pittsburgh itself.

No matter how critical one may be of the renewal process on other counts, there has never been any question of the desire of Allegheny County's redevelopment authorities to have the projects they carry out be in line with local desires—assuming that these desires are the outgrowth of competent study of the community. Considering the orientation of those presently directing these agencies this is not surprising. However, even if this attitude did not prevail, both the State and Federal legislation require local approval of proposed projects. Thus, both the local planning groups and the heads of the municipal governments are guaranteed the opportunity to approve the proposed renewal projects. In this step the advice of a planner is often found desirable, especially one who possesses an intimate knowledge of the community and in whom local officials have confidence. Not only do the technical aspects of both master plans and renewal plans frequently require evaluation locally when both are in harmony, but this need is even more vital when it is found desirable, as a consequence of the study of the details of the proposed renewal plan, to suggest that the master plan be amended in order to accommodate the reuses proposed by the renewal project. Whereas a comprehensive guiding plan for any municipality is of necessity a flexible chart of the community's future, if it has been thoughtfully prepared, it is not something to be revised without thoughtful consideration beforehand.

There is one additional aspect in which the planner's help has been found valuable in connection with the preparation of some of the redevelopment projects in the Pittsburgh Area. Entirely from the standpoint of protecting the U. S. taxpayers' possible contribution to such work, as part of the data to be submitted in justification of such a project, an up-to-date report on the status of local planning must be presented to the URA. This report is required to contain a review of what the community is doing to improve itself along lines other than renewal—it being recognized that renewal activities are only one facet of the total planning-effectuation picture. The Redevelopment Authority of Allegheny County customarily requires its planning consultants to prepare such a report—in a preliminary form early in their work on any project and in a final form later on. Where no steps other than renewal are being or seem likely to be taken locally to improve a community, it would obviously be unwise for the Federal government to expend funds for redevelopment.

Once the proposed renewal project has run the gauntlet of local and Federal review, it passes into the project execution stage. Here land is acquired and cleared, utilities are relocated and a new street pattern established, presumably in accordance with the already approved scheme for rebuilding the area. However, during this stage contracts are also entered into with redevelopers. Occasionally these request variations in the scheme which could not have been anticipated earlier, either because a specific redeveloper was not in the picture then, his thinking had not been perfected to a point where he knew what changes he desired, or for some other reason. Of course, the question of changes in the redevelopment plan may also originate within the community or the redevelopment authority. In any event, some technically-qualified review must be made of such proposals by an individual

who is able to reflect both the longterm interests of the community as a whole as well as the integrity of the redevelopment plan. In addition, even if no proposed changes are developed in the course of project execution, there will always be numbers of perfecting details pertaining to the plan to be evaluated. It is, therefore, seen that planning advice is necessary in connection with the execution phase of a renewal project in order to insure the successful transition from paper to reality. This need has also been recognized in the requirements of the URA.

I have been dealing solely with the involvement of the professional planner in the technical renewal process itself in the Pittsburgh Area. I have pointed out that it begins with the preparation and carrying out of the master plan for a community. This has usually been followed by the preparation of the redevelopment plan for the redevelopment authority, which often includes a review of the status of local planning. At the same stage a planner is also useful in advising the community itself relative to the renewal process. And finally, in the project execution phase the planner's services are valuable in connection with the matters of perfecting detail that will arise but even more so in regard to any changes in the plan that may be suggested.

In discussing the technical contributions of planners to the land clearance projects presently being carried out by this district's three redevelopment authorities, I have consciously used the words "redevelopment" and "renewal" interchangeably. In the strictest interpretation of the professional jargon that has sprung up in this field I should have used the word "redevelopment" since this more precisely defines these activities to date. On the other hand the word "renewal" was officially introduced into this picture in the Housing Act of 1954 as a generic term for the slum elimination process which might include redevelopment, rehabilitation and conservation—separately or in combination, as any given situation requires. In the years between 1949 and 1954 an appreciation gradually grew of the fact that the reconstruction of blighted areas would accomplish little if steps were not taken at the same time to prevent the formation of new slums primarily in the immediate neighborhood of which the slum being eradicated is an organic part but also in the city as a whole. The Housing Act of 1954 represented the initial attempts to translate this thinking into law.

As a consequence, we may confidently expect this much broader approach to be followed with respect to future urban renewal projects in the Pittsburgh Area. Within the frame of reference established by the comprehensive guiding plan for any community, the planner will be required to develop detailed schemes for tackling, as a series of projects extending over a period of years, all the shortcomings of complete neighborhoods. So we see that, as substantial as has been the contribution of the planning profession to Pittsburgh's renewal projects to date, this involvement has been relatively minor compared to the responsibilities and opportunities that lie ahead.

Journal of the
CITY PLANNING DIVISION
Proceedings of the American Society of Civil Engineers

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Discussion of
"IS PARKING A PUBLIC RESPONSIBILITY?"

by William R. B. Froehlich
(Proc. Paper 510)

WILLIAM R. B. FROEHLICH, A.M., ASCE.—In his discussion of the paper listed above, Mr. Nathan Cherniack presented a very lucid argument in favor of providing adequate off-street parking in the future through zoning. Mr. Cherniack agrees that the public does have a responsibility to exert every effort to make up present parking deficiencies, but states that future additions to the parking demand should definitely be the sole concern of private enterprise, by requiring provision of off-street parking facilities in new or partially constructed buildings.

The author will agree with Mr. Cherniack readily that the zoning ordinance is a proper vehicle for placing the responsibility for off-street parking where it belongs—with the builder of the parking generator. Several cities have enacted comprehensive revisions to outdated zoning ordinances which include the requirement of developers to provide integral off-street parking. However, in many instances, it is a difficult and often discouraging task to push such an ordinance through the legislative body, fighting general public lassitude and objections of special interests. And assuming that planning officials would have the good fortune to bring their efforts to a successful conclusion, the realization of results through zoning is a painfully slow process. In most of our metropolitan cities, the majority of structures downtown are more than thirty years old and obviously have many years of use ahead of them. An ordinance requiring new facilities to provide integral off-street parking will have no effect whatever on these structures. Therefore it seems that the present deficiency created by these existing generators will continue many years into the future, with only new construction providing hope for a solution to the parking dilemma.

It is emphasized that the public does have a responsibility for off-street parking in our business districts. Although requiring new construction, through zoning, to provide off-street parking holds promise for the future, it appears that the present problem of parking space deficiency will extend many years into the future because of the slowly changing face of our cities' business districts. During this period it is in the best interest of the city as a whole that its business districts remain vital and healthy. Adequate off-street parking is one factor in maintaining this vitality.

1. The first part of the paper is devoted to a general discussion of the problem of the existence of solutions of the system of equations

2. The second part of the paper is devoted to a detailed analysis of the case of the existence of solutions of the system of equations

3. The third part of the paper is devoted to a detailed analysis of the case of the existence of solutions of the system of equations

PROCEEDINGS PAPERS

The technical papers published in the past year are identified by number below. Technical-division sponsorship is indicated by an abbreviation at the end of each Paper Number, the symbols referring to: Air Transport (AT), City Planning (CP), Construction (CO), Engineering Mechanics (EM), Highway (HW), Hydraulics (HY), Irrigation and Drainage (IR), Power (PO), Sanitary Engineering (SA), Soil Mechanics and Foundations (SM), Structural (ST), Surveying and Mapping (SU), and Waterways and Harbors (WW) divisions. Papers sponsored by the Board of Direction are identified by the symbols (BD). For titles and order coupons, refer to the appropriate issue of "Civil Engineering." Beginning with Volume 82 (January 1956) papers were published in Journals of the various Technical Divisions. To locate papers in the Journals, the symbols after the paper numbers are followed by a numeral designating the issue of a particular Journal in which the paper appeared. For example, Paper 1113 is identified as 1113 (HY6) which indicates that the paper is contained in issue 6 of the Journal of the Hydraulics Division.

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